

Patent Claims

1. An optoelectronic module, comprising:
 - a carrier element having electrical connection electrodes and electrical lines,
 - at least one semiconductor component for emitting or detecting electromagnetic radiation, said semiconductor component being applied on the carrier element and being electrically connected to connection electrodes of the carrier element and having a radiation coupling area, and
 - at least one optical device assigned to the semiconductor component,characterized in that
 - a connecting layer made of a radiation-transmissive, deformable material is arranged in a gap between the radiation coupling area and the optical device, the optical device and the semiconductor component being fixed relative to one another in such a way that they are pressed against one another and that the connecting layer is thereby squeezed in such a way that it generates a force that strives to press the optical device and the radiation coupling area apart.
2. The optoelectronic module of claim 1, characterized in that the connecting layer has a thickness of at least 30 μm , preferably of at least 100 μm .
3. The optoelectronic module of claim 2, characterized in that the connecting layer has a thickness of greater than or equal to 150 μm and less than or equal to 350 μm .
4. The optoelectronic module of one of the preceding claims, characterized

in that the connecting layer has a lacquer, preferably a circuit board lacquer, which is deformable in a cured state.

5 5. The optoelectronic module of one of the preceding
claims,
characterized
in that a surface of the carrier element is at least
partly coated for protection against external
10 influences with a material that is also contained in
the connecting layer.

6. The optoelectronic module of one of the preceding
claims,
15 characterized
in that a refractive index of the connecting layer is
adapted to a refractive index of a material of the
semiconductor component that adjoins the connecting
layer and/or to a refractive index of a material of the
20 optical device that adjoins the connecting layer.

7. The optoelectronic module of one of the preceding
claims,
characterized
25 in that the optical device has refractive and/or
reflective elements.

8. The optoelectronic module of one of the preceding
claims,
30 characterized
in that the semiconductor component is a luminescence
diode component.

9. The optoelectronic module of one of the preceding
35 claims,
characterized
in that the semiconductor component is a surface-
mountable component.

10. A method for producing an optoelectronic module having at least the method steps of:

- providing
 - 5 - a carrier element having electrical connection electrodes and electrical lines,
 - a semiconductor component for emitting or detecting electromagnetic radiation, said semiconductor component having a radiation
 - 10 coupling area, and
 - an optical device,
- applying the semiconductor component on the carrier element and electrically connecting the semiconductor component to the connection
- 15 electrodes, and
- mounting the optical device above the radiation coupling area of the semiconductor component, characterized
 - in that, prior to mounting the optical device, a
 - 20 curable and - in a cured state - radiation-transmissive and deformable composition is applied at least over the radiation coupling area of the semiconductor component,
 - in that the applied composition is at least partly
 - 25 cured or let to be cured, and
 - in that the optical device and the semiconductor component are fixed relative to one another in such a way that they are pressed against one another and thereby that the connecting layer is
 - 30 squeezed in such a way that it generates a force the composition strives to press the optical device and the radiation coupling area apart.

11. The method of claim 10,
35 characterized
in that the composition is applied in the form of a layer having a thickness of at least 30 μm , preferably of at least 100 μm .

12. The method of claim 11,
characterized
in that the composition is applied in the form of a
5 layer having a thickness of greater than or equal to
150 μm and less than or equal to 350 μm .
13. The method of one of claims 10 to 12,
characterized
10 in that the composition has a lacquer, preferably a
circuit board lacquer, which is deformable in a cured
state.
14. The method of one of claims 10 to 13,
15 characterized
in that the composition is applied at least to a part
of a surface of the carrier element for protection
against external influences.
- 20 15. The method of claim 14,
characterized in that the composition is applied to the
radiation coupling area and to the surface of the
carrier element in a single method step.